

A Brief Introduction About Biostatistics at UF

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UF Informatics Institute

Introduction About Myself

- Education

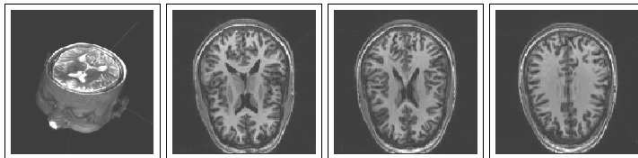
- BS in Mathematics, 1986, Fudan University, China
- MS in Statistics, 1989, Fudan University, China
- MS in Statistics, 1993, University of Georgia
- PhD in Statistics, 1996, University of Wisconsin - Madison

- Employment

- Lecturer in Statistics, 1989-1991, Fudan University, China
- Senior Research Consulting Statistician, 1996-1998, Biostatistics Center, Ohio State University
- Assistant, Associate, Full Professor (1998-2002, 2002-2007, 2007-2013), School of Statistics, University of Minnesota
- Professor and Founding Chair, 2013-present, Department of Biostatistics, UF

My Major Research Interests

- Jump Regression Analysis (JRA)
 - Linear regression: $Y = \alpha + \beta x + \varepsilon$
 - Parametric regression: $Y = \alpha + \beta x^\lambda + \varepsilon$
 - Nonparametric regression: $Y = f(x) + \varepsilon$
 - JRA: $f(x)$ has jumps
- Image Processing



- 2-D JRA model: $\xi_{ij} = f(x_i, y_j) + \varepsilon_{ij}$
- Qiu, P. (2005), *Image Processing and Jump Regression Analysis*, John Wiley.
- Edge Detection, Image Denoising, Blind Image Deblurring, Image Segmentation, Image Registration, 3-D Image Analysis, MRI/fMRI Image Analysis, **Image Comparison and Monitoring**

My Major Research Interests (con'd)

- Statistical Process Control
 - Tool for sequentially monitoring **production lines**
 - Internet traffic monitoring, spatio-temporal monitoring of environment (e.g., $PM_{2.5}$), disease surveillance, monitoring of image sequence, disease screening, ...
 - Spatio-temporal monitoring of big data streams
 - Qiu, P. (2018), "Jump Regression, Image Processing and Quality Control (with discussions)," *Quality Engineering*, **30**, 137–153.
 - Qiu, P. (2014), *Introduction to Statistical Process Control*, Chapman & Hall/CRC.
- Survival Analysis
 - Comparison of two crossing hazard rate curves
 - Treatment time-lag effect

Brief Introduction of Department of Biostatistics

- Short history: created in 2010, first chair appointed in 2013
- Faculty:
 - 11 tenure-track, 7 research-track, 2 clinical-track, 3 new members will join us in this summer
 - Total extramural research funding in 2017: \$10.29 million
 - Number of papers published each year: about 110
 - 2 AAAS fellows, 5 ASA fellows, 2 IMS fellows
 - Major expertise: Bayesian analysis, bioinformatics, cancer research, causal inference, high-dimensional data, clinical trial designs, genomics, image processing, infectious disease modeling, longitudinal data analysis, multivariate statistics, network data analysis, omics data analysis, nonparametric statistics, quality control, spatio-temporal modelling, sports statistics, statistical genetics, statistical education, survival analysis, time series analysis, and more.
- 2018 ranking (our first!) by US News & World Report
 - #20 among all biostatistics departments/programs
 - #55 among all statistics/biostatistics departments/programs

Brief Introduction of Department of Biostatistics (con'd)

- Students:
 - PhD students (23)
 - On-campus MS students (22), online MS students (23)
 - MPH with concentration in biostatistics (11)
- Courses:
 - We offer about 15 courses each semester.
 - For a complete list, see <http://biostat.ufl.edu/education/course-descriptions/>

Brief Introduction of Department of Biostatistics (con'd)

- Children's Oncology Group (COG) Statistics and Data Center (Director: Dr. Mini Devidas)
- Center for Statistics and Quantitative Infectious Diseases (Director: Dr. Ira Longini)
- Biostatistics Consulting Lab (Director: Dr. Zhiguang (Caleb) Huo)
- Biostatistics and Epidemiology Research Design (BERD) at CTSI (Director: Dr. Peihua Qiu)
- Data Coordinating Center at CTSI (Director: Dr. Sam Wu)
- Biostatistics Core at UF Health Cancer Center (Director: Dr. Ji-Hyun Lee)

Personal Perspectives About Data and Data Science

- Data versus patients (statisticians versus medical doctors).
- Data often have more complicated structure than what we thought (e.g., image data, data integration).
- Misleading results could be more harmful than no results.
- Data science is a science, implying that we should fully understand the reasoning behind statistical conclusions.
- After all, we should respect data and data analysis more!